

REMARKS

This amendment is responsive to the Office Action dated September 25, 2009. Claims 11-26 are pending in this application prior to this amendment, and claims 11-26 stand rejected. Claims 11, 13, 14 and 16-26 have been amended in formal respects to better conform to U.S. practice. Claim 15 has been canceled. Claims 27 and 28 are new. In view of the following remarks, Applicants respectfully solicit reconsideration and allowance of this application.

Rejections under 35 USC §102

The Examiner rejected claims 11, 12, 15, 17-20 and 22-26 under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 6,584,858 to Miyazawa et al. ("Miyazawa '858"). Of the rejected claims, claims 11 and 15 are independent. Claim 15 has been canceled and replaced by new independent claim 27.

Claim 11 recites a method of testing the bond strength of an electrically conductive ball adhered to a substrate, the method comprising, "moving the ball in a direction substantially orthogonal to the plane of adherence of the ball while urging the substrate against the ball, and abruptly halting the substrate." Thus, claim 11 requires that the substrate is moved with the ball as it is "urged" against the ball.

Miyazawa '858 is directed to a device and method for testing adhesive strength. As shown in Figures 1A-1C, Miyazawa '858 discloses a moveable base plate (3) including a roller (11) that moves downward into contact with an adhesive surface (15A) of a sample (15). The base plate (3) includes a load cell (25) coupled to a reel of tape (23) extending around the roller (11). The load cell (25) measures the amount of force required to peel the roller (11) and tape (23) from the adhesive surface (15A) as the base plate (3) moves upward. The Examiner cites the roller (11) as the claimed

"ball" and the adhesive surface (15A) as the claimed "substrate," and argues that Miyazawa '858 discloses "moving the ball in a direction substantially orthogonal to the plane of adherence of the ball whilst urging the substrate lightly against the ball, and abruptly halting the substrate" at col. 3, lines 3-15 (Office Action, page 2). However, this passage of Miyazawa '858 only provides structural details about the roller (11) and the sample (15), such as the sample (15) being placed on a platform (16). There is no teaching in Miyazawa '858 that the sample (15) or platform (16) moves during the testing of the adhesive surface (15A). In contrast, only the roller (11) moves into and out of engagement with the sample (15) (*see* col. 3, line 54 – col. 4, line 7). Thus, Miyazawa '858 fails to disclose any method including moving the substrate with the ball and abruptly halting the substrate.

For at least these reasons, claim 11 is allowable over Miyazawa '858. Claim 12 recites a unique combination of method steps also allowable over Miyazawa '858 for at least the same reasons. Applicants respectfully request that the rejection of claims 11 and 12 now be withdrawn.

As noted above, new claim 27 has been added to replace canceled claim 15, and claims 16-26 now depend directly or indirectly from claim 27. Claim 27 recites an apparatus for tensile testing of the bond of an electrically conductive ball adhered to a substrate, the apparatus comprising, *inter alia*, "a gripper for gripping a ball adhered to a substrate," and "an abutment adapted to restrain the substrate while the apparatus for moving said gripper continues to move said gripper along said axis to break the ball off the substrate." The Examiner relies on the embodiment of Miyazawa '858 illustrated in Figure 6 for the teaching of each of the elements of claim 15. However, Miyazawa '858 fails to disclose multiple elements now recited in claim 27.

The Examiner states that Miyazawa '858 teaches: "a ball or guide member 56 is adhered to a substrate 57" (Office Action, page 2). Consequently, the Examiner is citing the plate-shaped member (56) of Figure 6 as the claimed "ball" and the sample holder (57) as the claimed "substrate." In contrast, the sample holder (57) includes an opening (57a) through which the plate-shaped member (56) may pass to engage with the adhesive surface (15a) of the sample (15) as previously described (col. 5, lines 47-51). The plate-shaped member (56) never engages or adheres to the sample holder (57) in any manner. Miyazawa '858 fails to disclose "an electrically conductive ball adhered to a substrate," and therefore also fails to disclose breaking a ball off the substrate.

The Examiner further states that Miyazawa '858 teaches that "a gripper or holding means 57b holds the ball 56" (Office Action, page 2). The alleged "gripper" is a flange portion (57b) of the sample holder (57) in Figure 6, and the flange portion (57b) surrounds the aforementioned opening (57a) (col. 5, lines 49-51). The flange portion (57b) therefore does not interact with the plate-shaped member (56), and Miyazawa '858 fails to disclose "a gripper for gripping a ball adhered to a substrate."

Consequently, claim 27 is allowable over Miyazawa '858. Claims 17-20 and 22-26 depend from claim 27 and recite a unique combination of features also allowable over Miyazawa '858 for at least the same reasons. Applicants respectfully request that claim 27 now be allowed and the rejection of claims 17-20 and 22-26 now be withdrawn.

Rejections under 35 USC §103

The Examiner rejected claims 13, 14, 16 and 21 under 35 U.S.C. § 103 as being obvious over Miyazawa '858 in view of U.S. Patent No. 5,948,997 to Schmidt

("Schmidt '997"). Claims 13 and 14 depend from independent claim 11, and claims 16 and 21 depend from independent claim 27. For at least the same reasons provided above as to claims 11 and 27, claims 13, 14, 16 and 21 are allowable over the cited references. Additionally, Schmidt '997 is relied on only for the teaching of a pneumatic ram and fails to overcome the previously-discussed deficiencies of Miyazawa '858 with respect to claims 11 and 27. More specifically, Schmidt '997 fails to teach movement of a substrate with a ball, adhering a ball to a substrate, or a gripper for gripping the ball. Thus, Schmidt '997 and Miyazawa '858 fail to disclose each of the method steps of claims 13 and 14 and each of the elements of claims 16 and 21. Applicants respectfully request that the rejection of claims 13, 14, 16 and 21 now be withdrawn.

New Claim

Applicants have added new independent claim 28 in this response. Claim 28 recites a method of testing the bond strength of an electrically conductive ball adhered to an electronic substrate. More specifically, claim 28 includes "moving the substrate and test tool in unison towards the abutment while urging the ball against the test tool" and "causing the substrate to contact the abutment to abruptly halt the substrate." For at least the same reasons provided above as to claim 11, claim 28 is allowable over Miyazawa '858 and Schmidt '997, which do not teach movement and abrupt halting of a substrate. Applicants respectfully request that claim 28 be allowed without delay.

Conclusion

Applicants respectfully submit that the foregoing is a full and complete response to the Office Action dated on September 25, 2009. If the Examiner believes

any matter requires further discussion, the Examiner is respectfully invited to telephone the undersigned attorney so that the matter may be promptly resolved.

Applicants do not believe that any fees are due in connection with this response. However, if such petition is due or any fees are necessary, the Commissioner may consider this to be a request for such and charge any necessary fees to Deposit Account 23-3000.

Respectfully submitted,

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